ENERGY CUMULATION IN A THREE-STAGE LAYERED SYSTEM [[1]](#footnote-1)\*)

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The paper considers an analytical method for constructing solutions in the problems of mathematical modeling of the motion of layered systems. Such systems were investigated in connection with the cumulation of energy [1] and, in particular, for the implementation of controlled thermonuclear fusion [2]. Layered systems are constructions of thin (relative to their linear dimensions) flat, cylindrical or spherical layers, nested into each other. Their movement occurs when energy is instantly or distributed over time into some of the layers. The purpose and selection of layers is to organize the cumulation of the fraction of the energy deposited into the geometric center of the system. The cumulation efficiency is estimated by the value of this energy fraction.

The simplest version of a layered system is three layers: an inner layer and two adjacent to it (one-stage system). Energy is deposited in the inner layer.

More complex systems (two-stage, three-stage) are built from a single-stage system by adding layers separated by gaps. But in more complex systems, energy is deposited already in each of the layers.

The purpose of this work is to consider cumulation in a three-stage system. Energy input begins with an external cascade. Energy input into internal cascades begins to be carried out at the moment when a neighboring cascade flies up to it.

When energy is deposited (as a rule) into the middle layer, the surrounding layers begin to scatter. These layers receive mainly kinetic energy. From the laws of conservation of mass, momentum and energy, under certain assumptions, the average velocities of these layers are found as a function of the distance traveled.

The ultimate goal of the research is to determine the value of the cumulative energy and to reveal its dependence on the parameters of a particular system and methods of energy input, to study the advantages of a three-stage system in comparison with one-stage and two-stage systems.

References

1. 1.Zababakhin E.I., Zababakhin I.E. Phenomena of unlimited cumulation // Moscow: Nauka, 1978.
2. 2. Dolgoleva G.V., Zabrodin A.V. Cumulation of energy in layered systems and implementation of shockless compression // Moscow: Fizmatlit, 2004, 71 p.

1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVIII/It/ru/DC-Ponomarev.docx) [↑](#footnote-ref-1)